

**JEDDA, A NEW GENUS OF THYMELAEACEAE
(SUBTRIBE LINOSTOMATINAE) FROM AUSTRALIA**

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Summary

Jedda multicaulis J. Clarkson *gen. et sp. nov.* is described and discussed. It is closely allied to the Asian genus *Linostoma*, and is the first representative of the subtribe *Linostomatinae* recorded from Australia. The species is known only from a small area 50 km west of Laura on Cape York Peninsula.

The subtribe *Linostomatinae* of the Thymelaeaceae as circumscribed by Domke (1934) includes the genera *Lophostoma*, *Enkleia* and *Linostoma*. *Lophostoma* is a South American genus of four species restricted to the Amazon drainage system while the other two genera are Asian. *Linostoma* with three species extends from India through Indochina and the Malay Peninsula to Borneo. *Enkleia* with four species occurs from Burma, Thailand and Cambodia southwards through the Malay Peninsula, Andaman Islands and Sumatra to Bangka and eastwards through Borneo to western New Guinea and the Philippine island of Luzon. The discovery of a new genus from Australia referable to this subtribe is of considerable interest as it adds to the intriguing world distribution of the subtribe. **Fig. 1.**

There has been no recent review of the subtribe *Linostomatinae*. Revisions of *Linostoma*, *Enkleia* and *Lophostoma* were published separately by Nevling in the early 1960's (Nevling 1961a, 1961b, 1963) but the general review foreshadowed in the introduction to the first of these was never published.

Jedda multicaulis J. Clarkson *gen. et sp. nov.*, a ceteris generibus subtribi *Linostomatinarum* habitu multicauli fruticoso, orinatione florenti determinata, bracteis coloratis foliaceis vel foliis bracteaceis in vel sub inflorescentia dispositis et fructu grandissimo distinguenda. **Typus:** Queensland, Cook District: between Jedda Creek and the Kennedy River, 15°37'S, 143°57'E, 18 Oct 1982, J.R. Clarkson 4584 (holotypus BRI 297221, isotypi, A, CANB, DNA, F, K, L, MEL, MO, NSW, PERTH, QRS, SING).

Frutex erectus sempervirens 1.5-2 m altus caulibus pluricentum sparsim ramosis caule tumido subterraneo exorienti. Folia opposita vel subopposita simplicia exstipulata glabra; petioli 3-4(-4.5) mm longi; lamina ovata-elliptica (2.5-)4-6(-7) cm longa 1-2.5 cm lata coriacea discolor; basis cuneata-obtusa; margo intergra; apex acutus-acuminatus; venatio pinnata; venae principales laterales numerosae 6-8 per cm parallelae ± rectae. Inflorescentiae in ramis brevibus in axillis foliorum summorum dispositae, paniculiformes, ramis 3, saepe varie reductae; fasciculi florum determinati, floribus 3(-5), raceformes. Flores ± regulares 5-meri vel subinde 4-6-meri bisexuales; tubus floris cylindricus perigynus 7-9 mm longus ad orificium 1.5 mm latus; lobi calycini 5 raro 4-6 linguiformes-spathulati 6.5-8 mm longi 3-4.5 mm lati; petala respectu numero lobo calycini duplicia, alba anguste clavata 3.7-5 mm longa; stamina numero petalorum aequalia; filamenta filiformia 5-7 mm longa glabra alba; antherae oblongae bicellulares basifixae 1-1.5 mm longae longitudinaliter dehiscentes; ovarium superum breviter stipitatum uniloculare, (cum stipite) 2.5-3 mm longum dense sericeum in dimidio supero; stylus terminalis 15-16 mm longus glaber; stigma capitatum terminale ± papillatum 0.5-0.75 mm diametro; discus annularis squamis irregularibus ca 0.5 mm longis galber. Fructus glabrescens stipitatus irregulariter pyriformis 6-7(-8) cm longus 4-6 cm latus indehiscens interdum viviparus; pericarpium crassum coriaceum viride ubi maturum atrofuscescens sub germinatione; stipes variabilis 1-2 cm longus 1-1.5 cm latus saepe valde recurvus.

Erect, evergreen shrub, 1.5-2 m tall with up to several hundred sparsely branched stems arising from a swollen underground stem; young stems terete, reddish brown, glabrous; lenticels conspicuous, round, becoming ± horizontally elongate. Leaves opposite or subopposite, simple, exstipulate; petiole glabrous, slightly rugose, 3-4(-4.5) mm long; leaf blade ovate to elliptic, widest at or slightly below the middle, (2.5-)4-6(-7) cm long,

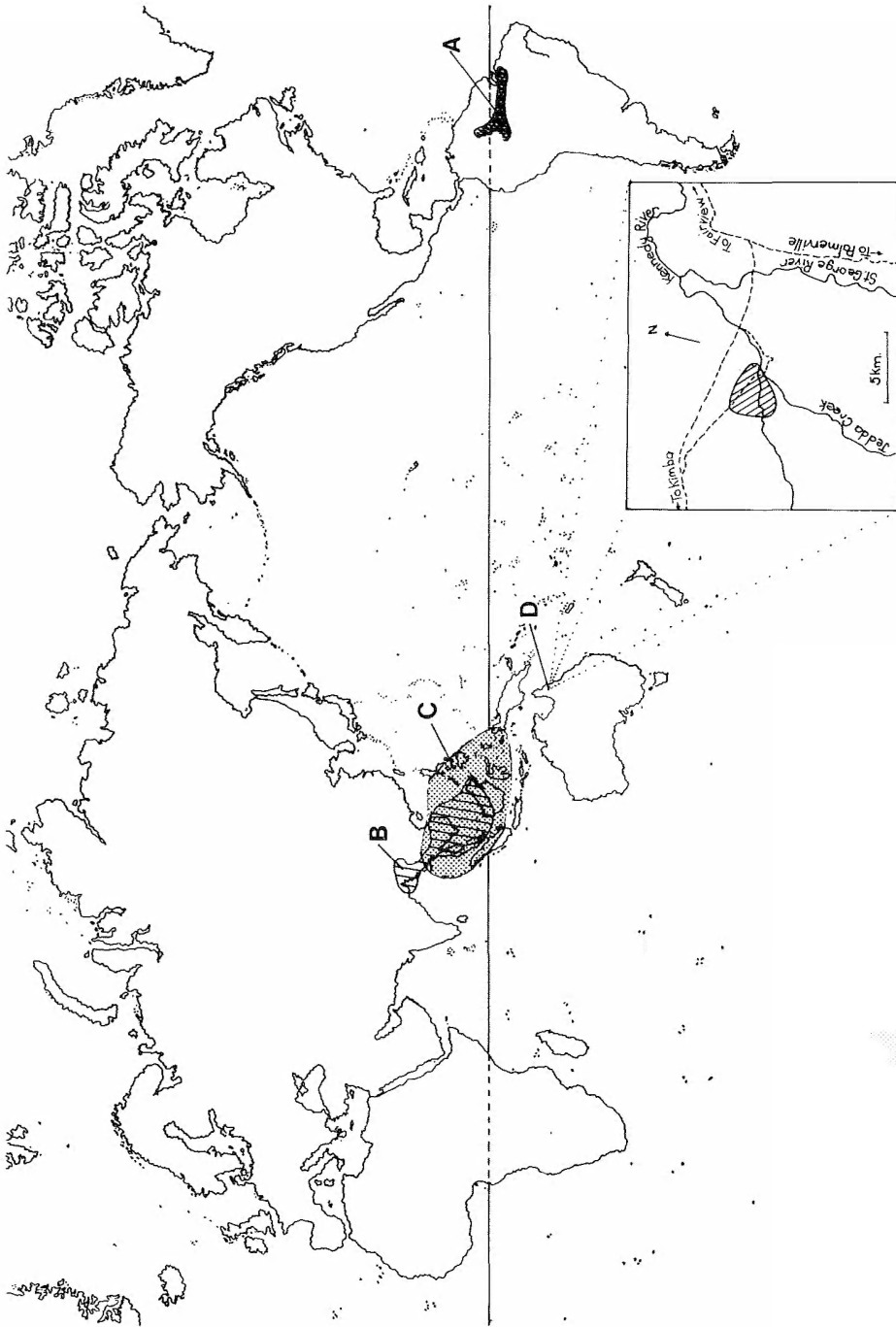


Fig. 1. World distribution of the subtribe *Linostomatinae-Lophostoma* (A), *Linostoma* (B), *Enkleia* (C), *Jedda* (D) and location of only known population of *Jedda multicaulis*.

1–2.5 cm wide, glabrous, coriaceous, discolourous; base cuneate to obtuse; margin entire; apex acute to acuminate; venation pinnate; mid vein plain to impressed above, raised beneath; primary lateral veins numerous, 6–8 per cm, parallel, \pm straight, terminating in well developed marginal vein; secondary veins anastomosing. Inflorescence on short axillary branches in the uppermost leaf axils, paniculiform, with 3 branches, often variously modified by reduction; subtending leaves much reduced, 2–3 mm long, 1–1.5 mm wide; primary peduncle 3–6 mm long with 1 or rarely 2 pairs of opposite or subopposite bracts, terminated by a pair of opposite bracts; flowers clusters determinate, 3(–5)-flowered, racemiform; rachis much contracted, to 0.5 mm long (often barely perceptible in 3-flowered cluster); secondary peduncle extremely short, at most 0.5 mm long; uppermost flower single, ebractiolate; lower flowers paired, subtended by a single bracteole; bracteole ovate to elliptic, subsessile, 2–4 mm long, 1–1.5 mm wide; pedicel with a clearly marked articulation at the base where it joins the secondary peduncle, glabrous, 4–4.5 mm long, enlarging in fruit to 10 mm long \times 8 mm wide. Flowers \pm regular, 5-merous or occasionally 4–6-merous, bisexual, sweetly perfumed; floral tube cylindrical, perigynous, 7–9 mm long, 1.5 mm wide at the orifice, pale green, glabrous except for a few downward facing trichomes inserted on the inner surface between the whorls of stamens and corolla lobes, longitudinally and unilaterally ruptured by the developing fruit, persistent at the base of the mature fruit; calyx lobes 5, rarely 4–6, quincuncial in bud when 5 otherwise imbricate, subequal, outer 3 somewhat broader and more hooded than inner 2, linguiform to spatulate, 6.5–8 mm long, 3–4.5 mm broad, slightly shorter than the floral tube, glabrous, pale green, strongly reflexed at anthesis, closing after pollination; petals twice the number of calyx tube, narrowly clavate, somewhat fleshy, 3.7–5 mm long, erect and spreading at anthesis; apex of petals irregular; stamens equal in number to the petals and somewhat longer than them, inserted in a single whorl below the petals, erect and spreading at anthesis; filaments filiform, enlarging slightly distally, 5–7 mm long, glabrous, white; alternisepalous filaments shorter than the antisepalous filaments by about half the length of an anther in the mature bud, \pm equal in length by anthesis; anthers oblong, 2-celled, basifixed, 1–1.5 mm long, longitudinally dehiscent; connective produced slightly beyond the anther cells; pollen polyporate, highly sculptured, 60–65 μ m diameter; ovary superior, shortly stipitate, unilocular with a single anatropous ovule attached to the upper lateral wall; ovary and stipe 2.5–3 mm long, densely sericeous in the upper half; style terminal, 15–16 mm long, glabrous; stigma capitate, terminal, \pm papillate, 0.5–0.75 mm diameter; disc annular, with irregular scales ca 0.5 mm long, glabrous. Fruit glabrescent, stipitate, irregularly pyriform, 6–7(–8) cm long, 4–6 cm wide, indehiscent, occasionally viviparous; pericarp thick, leathery, green when mature, turning dark reddish brown at germination; stipe variable, 1–2 cm long, 1–1.5 cm wide, often strongly recurved. Seed lacking endosperm; cotyledons fused, fleshy, occupying almost entire volume of seed. **Fig. 2.**

Etymology: The generic name is taken from Jedda Creek, a tributary of the Kennedy River. The plant is known only from the vicinity of this stream. The specific epithet refers to the multistemmed habit of the plant.

Distribution: Endemic in a small area along Jedda Creek upstream from its junction with the Kennedy River, 50 km west of Laura on Cape York Peninsula. **Fig. 1.**

Specimens examined. Queensland. COOK DISTRICT: Apr 1980, Clarkson 3196 (BRI), 3245 (BRI, QRS), Oct 1981, McKeague & Miller s.n. (BRI, CANB, F, K, L, PERTH, QRS), Dec 1981, Clarkson 4188 (AD, BRI, CANB, DNA, F, K, L, MEL, MO, NSW, PERTH, QRS, SING), May 1982, Clarkson 4281 (BRI, QRS), Oct 1982, Clarkson 4584 (A, BRI, CANB, DNA, F, Q, L, MEL, MO, NSW, PERTH, QRS, SING), Sep 1983, Clarkson 5005 (BRI, CANB, K, L, MEL, QRS), Nov 1983, Clarkson 5031 (BRI, K), Jan 1984, Clarkson 5121 (BRI, QRS).

Habitat: The plant occurs in *Eucalyptus tetradonta* open forest on flat to gently undulating sandy red earth. Associated tree species include *Eucalyptus nesophila*, *E. polycarpa*, *E. dichromophloia* s. lat., *Erythrophleum chlorostachys*, *Grevillea glauca* and *Parinari nonda*.

Biology: Flowering occurs in October with the onset of the summer storm activity. Not all plants appear to flower each year. The sweetly scented flowers and the spreading stamens suggest insects may be the major pollinators. Fruits mature by late January to early February with usually only a single fruit developing to maturity in each flower cluster. Germination often occurs while the fruit is still attached to the parent shrub although such vivipary is not obligatory. The germination behaviour is unusual and will be described and discussed in detail elsewhere (Clarkson and Clifford, in prep.). Local property owners suggest that the plant may possibly be toxic to cattle but this has not been confirmed by feeding tests.

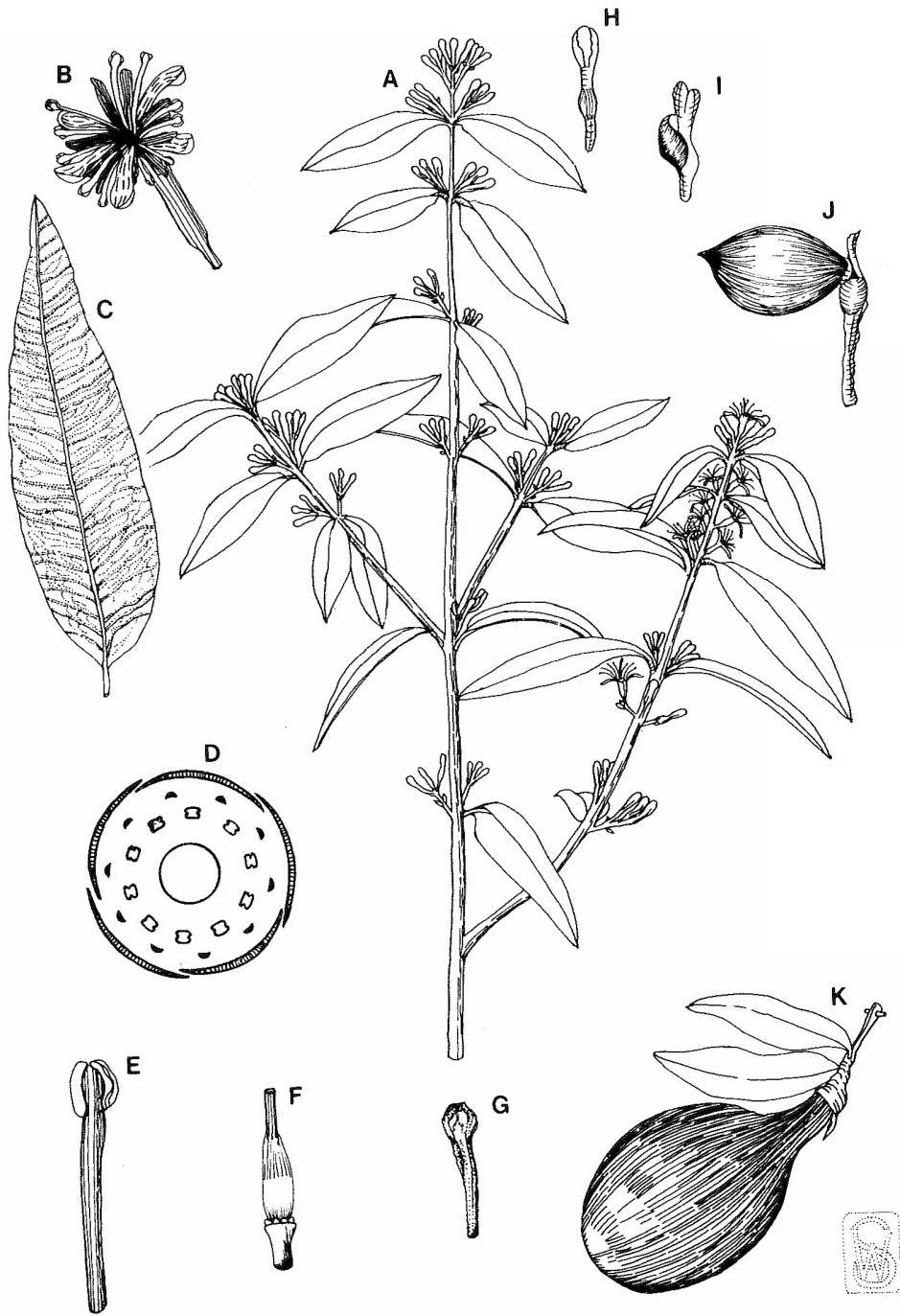


Fig. 2. *Jedda multicaulis*: A. flowering branchlet (Clarkson 4584) $\times 1/2$. B. flower (Clarkson 4584) $\times 1.5$. C. leaf (Clarkson 4584) $\times 1$. D. floral diagram. E. stamen (Clarkson 4584) $\times 6$. F. ovary and disk (Clarkson 4584) $\times 6$. G. stigma (Clarkson 4584) $\times 6$. H-J. developing fruit showing unilateral and longitudinal rupture of floral tube (Clarkson 5031) $\times 1$. K. mature fruit (Clarkson 5121) $\times 1/2$.

Conservation Status: Although locally abundant, the species is known only from a relatively small area probably totalling no more than 5 square kilometres. Present land use does not appear to be adversely affecting the population and it is not likely to change significantly in the foreseeable future. The plant is rather attractive in new growth and may have potential for cultivation as a small specimen shrub or perhaps as a hedging plant if it will respond to the necessary pruning.

Jedda is distinguished from other members of the subtribe *Linostomatinae* by its shrubby habit, determinate flowering pattern, lack of coloured foliaceous bracts or bract-like leaves in or below the inflorescence and extremely large fruit which is larger than any known to have been previously described for the Thymelaeaceae. Together with *Linostoma* and *Enkleia* it can be distinguished from *Lophostoma* by the trichomes of the flower which are straight and in which the cell wall is smooth. In *Lophostoma* the cell wall is undulate giving the hairs a somewhat crinkled appearance. The close, parallel pattern of veins in the leaf readily separates *Jedda*, *Linostoma* and *Lophostoma* from *Enkleia* where the primary veins are more widely spaced, arcuate-ascending and the secondary reticulum more pronounced. **Table 1.**

Table 1. Characteristics of genera of the subtribe *Linostomatinae*.

	Linostoma	Enkleia	Lophostoma	Jedda
1. Number of species	3	4	4	1
2. Scandent shrubs or lianes	usually	usually	+	-
Erect shrubs	-	-	-	+
3. Coloured foliaceous bracts present in or below the inflorescence	+	+	+	-
4. Flowering pattern determinate	-	-	-	+
Flowering pattern indeterminate	+	+	+	-
5. Flowers haplostemonous	1 sp.	-	-	+
Flowers diplostemonous	2 spp.	+	+	-
6. Number of primary veins in K-lobes	3	3-5	12	3
7. Trichomes of flowers with undulated cell wall	-	-	+	-
Trichomes of flowers with straight cell wall	+	+	-	+
8. *Fruit large >4 cm diameter	-	-	-	+
Fruit small <2 cm diameter	+	+	+	-
9. *K-tube accrescent, surrounding mature fruit	2 spp.	-	+	-
K-tube transversely ruptured by developing fruit	-	2 spp.	-	+
K-tube longitudinally ruptured by developing fruit	1 sp.	1 sp.	-	-

* The fruit of *Enkleia thorelii* is unknown.

On floral characters alone *Jedda* is difficult to distinguish from the Asian genus *Linostoma* but floral features which have been considered diagnostically important in the past and which have been used to separate the genera of the *Linostomatinae* break down in the light of Nevling's work (Nevling 1961a, 1961b, 1963). *Enkleia* has been distinguished from *Linostoma* by having the stamens arranged in two whorls rather than in a single series (Ding Hou 1960; Hutchinson 1967) and by the style being shorter as opposed to longer than the ovary (Domke 1934; Ding Hou 1960; Hutchinson 1967) yet the flowers of both *Linostoma persimile* and *L. pauciflorum* are diplostemonous (Nevling 1961a) and the style of *Enkleia siamensis* subsp. *siamensis* is often much longer than the ovary (Nevling 1961a). The absence of a disc in *Lophostoma* has been considered an important diagnostic character (Domke 1934) but Nevling (1963) confirmed the presence of this structure in at least two species of the genus, *L. calophylloides* and *L. ovatum*. The characters which remain to distinguish the genera are largely non floral and include the nature of the bracts within the inflorescence, the cellular structure of the trichomes associated with the flower, the pattern of leaf venation and the nature of the fruiting calyx. Generic limits within the Thymelaeaceae are however often much narrower than those accepted in many other families. Attention has been drawn to this by several authors including Ding Hou (1960) in his treatment of the family for Flora Malesiana. This treatment of *Jedda* as distinct from the other genera of the *Linostomatinae* is therefore consistent with the generally accepted taxonomic view of the subtribe and is in line with the narrow generic limits commonly encountered in the Thymelaeaceae.

Key to the genera of the subtribe *Linostomatinae*

1. Primary lateral veins widely spaced, less than 5 per cm, arcuate-ascending; secondary reticulum conspicuous **Enkleia**
 Primary lateral veins closely spaced, more than 5 per cm, parallel and straight; secondary reticulum inconspicuous 2
2. Inflorescence lacking coloured foliaceous bracts, not subtended by coloured bract-like leaves; mature fruit greater than 4 cm diameter **Jedda**
 Inflorescence with a pair of coloured foliaceous bracts or subtended by coloured bract-like leaves; mature fruit less than 2 cm diameter 3
3. Calyx lobes with more than 10 primary veins; trichomes of flower crinkled **Lophostoma**
 Calyx lobes with 3 primary veins; trichomes of flower straight **Linostoma**

The inflorescence of *Jedda* appears to be a highly complicated structure the interpretation of which is made difficult by the contraction of the branches and by varying degrees of reduction. A schematic representation of the inflorescence is shown in **Figure 3**. The terminology used follows that applied by Nevling to the inflorescence of *Daphnopsis* and later used by him in his revisions of the genera of the *Linostomatinae*.

There has been considerable debate as to the nature of the internal appendages of the floral tube in some members of the Thymelaeaceae. Heinig (1951) reviewing various interpretations of the origin and morphology of these petal-like organs and on the basis of her own anatomical studies suggested they were stipular appendages of the sepals and considered the flower to be apetalous. More recent work by Bunniger (1972) suggests they are in fact petals thus supporting the view adopted by Nevling (1959) in his revision of *Daphnopsis* and retained by him in his later studies of *Linostoma*, *Enkleia* and *Lophostoma*. No attempt is made here to judge the relative merits of Heinig's or Bunniger's work. On purely practical grounds when examining the flower of *Jedda* these structures will most likely be interpreted as petals but having done so attempts to successfully key the plant to Thymelaeaceae in the key to families in Volume 1 of 'Flora of Australia' will fail. The conversion of couplet 367 (page 135) to a triplet to read as follows will remedy the situation.

367. Ovary 1-locular **Thymelaeaceae**
 Ovary 3-6-locular **368**
 Ovary 10-15-locular **Sonneratiaceae**

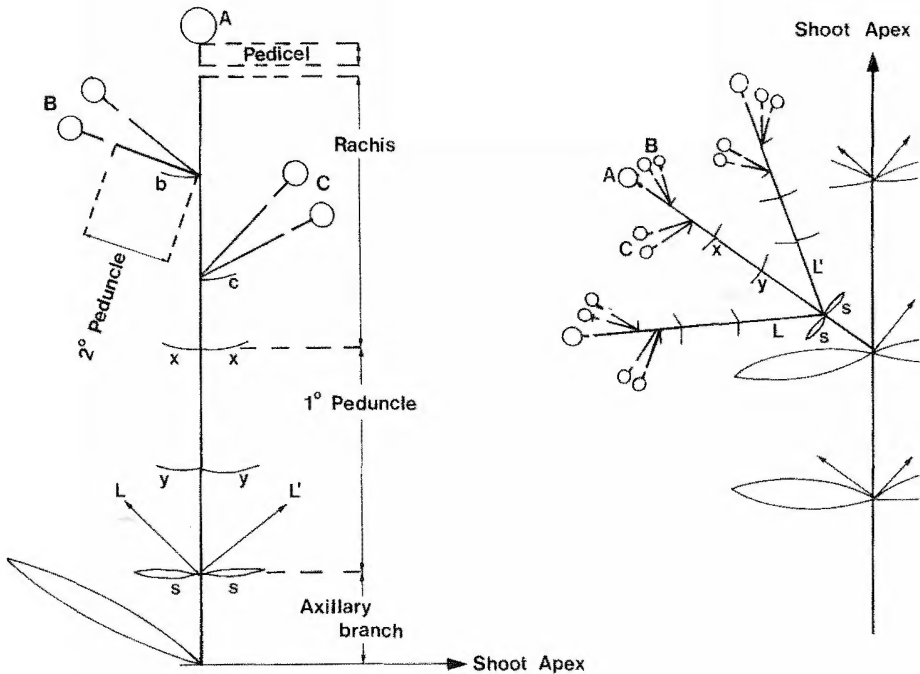


Fig. 3. Schematic representation of the inflorescence of *Jussiaea multicaulis* showing racemose flower cluster and branching pattern. S = subtending leaves; L, L' = lateral flower clusters; x, y = bracteoles of primary peduncle; b, c = bracteoles of flower pairs B & C; A = terminal flower.

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